Welcome!

to the
Frederick Seitz
Materials Research Laboratory
Central Research Facilities

Orientation for New Researchers
MRL is one of several user facilities (shared labs) on campus.

Use any or all facilities which best suit each part of your research.

MRL  
Materials Research Lab

MNTL  
Micro and Nanotechnology Lab

Beckman Institute

IGB  
Institute for Genomic Biology
At MRL You Can:

- Characterize materials from the nanoscale to the centimeter scale.
- Fabricate micro/nanomaterials and devices.

**CMM**
Center for Microanalysis of Materials: characterization by microscopy, x-rays and surface analysis

**Microfab**
Also called the Cleanroom, the Fab and 3rd floor

**LSF**
Laser and Spectroscopy Facility: Characterization by optical techniques
Where are the MRL Central Research Facilities?

Most Central Research Facilities labs are in the basement or 3rd floor of MRL or Supercon

You are here.
Your account (University CFOPA*) submitted with the proposal is how your MRL Central Research Facilities use is billed each month.

To change your account contact mrl-facilities@illinois.edu or stop by the MRL office.

More than one project? A new PI or different fund source requires submitting a new proposal. Each MRL ID is tied to one CFOP-A.

Adding a technique to your existing project? Submit a “change-of-scope” (instead of a “new”) proposal.

To purchase from a storeroom, use the correct account/CFOPA for buying things. This may not be the same used for facilities use billing.

* A stands for Activity code. Not all accounts have one of these.
Useful Storerooms on Campus

Physics/MRL Shipping-Storeroom
- 1st floor, between MRL and Loomis
- Net ID, AD password and CFOP
  Self check-out (record ALL items using computers at the counter)
- Pick up or mail packages or borrow carts

SCS Storeroom
- Roger Adams Lab, ground floor

ECE Storeroom
- New ECE building (near Beckman)
Safety

at the
Frederick Seitz
Materials Research Laboratory
Central Research Facilities

Orientation for New Researchers
Make sure your health insurance is current.

During the summer, student health insurance doesn’t automatically continue if you are not enrolled.

Opt in from the Office of Student Health Insurance: http://si.illinois.edu/
BEAP is the campus-wide initiative to provide annual training on what to do and where to go in case of an emergency.

- Training is on Compass: Training > BEAP > MRL
- BEAP Instructions: [http://mrl.illinois.edu/BEAP](http://mrl.illinois.edu/BEAP)
- You must be up to date on your BEAP training to log in to the scheduling calendar to request instrument training or to receive key access to the MRL.
In case of a serious injury or other emergency, get help immediately.

- Call 911 from a cell phone.
- Get medical attention!
  Even if you are otherwise okay (err on the side of caution)

In case of fire or hazardous chemical release:

- Pull the fire alarm
- Call 911 from a cell phone.
- If a fire alarm is sounded, you must leave the building immediately.
  Meet at Grainger Library.
If your injury is not serious (no bleeding, not unconscious, nothing’s broken), go to your nearest health care provider.

- McKinley for undergrads
- Wherever you have health insurance (Carle, Christie, etc.)

Notify Susan Logan ([sklogan@illinois.edu](mailto:sklogan@illinois.edu)) in 2007 Supercon within 24hrs. Fill out Injury/Incident Report forms so:

- MRL administration can address safety issues
- Insurance will be able to cover your medical costs
Working Late or on the Weekend?

Use the buddy system

- Bring your outside door key, as the building will be locked.
- Have someone within shouting distance who can help you in case of an emergency.
- If you’re doing anything hazardous, don’t work alone. (a buddy must be present for hazardous tasks)

Don’t let strangers into the building.

SafeWalks and SafeRides phone numbers are on the back of your i-card.
Gloves are PPE
Gloves are PPE

1. They protect YOU from
   - the process that you’re performing
   - the materials that you’re handling
Gloves are PPE - and sometimes

1. They protect YOU from
   - the process that you’re performing
   - the materials that you’re handling

2. They protect YOUR SAMPLES or equipment from you (skin particles, oils, etc.)
The Right Glove for the Right Job

Gloves may or may not be needed.

- Different types for different instruments or samples
- Ask during training

nitrile gloves
for precision work

cryogenic gloves
for extreme temperatures
PPE is for LAB WORK...

Do not touch personal items or “common fixtures” with gloves.

Throw out gloves after you’ve used them once.
Protect yourself!

In MRL labs you are expected to wear:

- Long pants
- Close-toed shoes
- Clothing that will not get caught on things
- Eye protection when needed
- And if you have hair that can get in the way, please tie it back out of the way.
No Food or Drinks Allowed in Any of the Labs

You are welcome to eat or drink:

- in the lounges on the 2nd and 3rd floor and
- in the room in the center of the basement
You are welcome to eat or drink in the lounges on the 2nd and 3rd floor of Supercon and in the break room in the center of the basement of MRL.
Door Signs

in front of every lab

Room number

Staff contact information
- in case of instrument problem
- contact right after an emergency

Potential safety hazards in the room

For medical/safety emergencies, call 911
MRL is a Biosafety Level 1 Facility

All biological materials must be approved by MRL’s biosafety officer, Lou Ann Miller: lamiller@illinois.edu before they are brought to MRL.

- Biological: anything that is, or was, alive and derivatives of those things (proteins, plants, cells, etc.).
- Biological materials must be disclosed on your proposal.
- **BE SPECIFIC IN YOUR DESCRIPTION OF MATERIALS** Don’t just say “cells”, “proteins”, “drugs” or “polymers”.

Fixative is available for free (contact Lou Ann Miller).

Beckman Institute, MNTL BioNanotechnology Labs, or IGB are alternative facilities for biological work.
Safety Data Sheets

Read SDS to understand hazards associated with each material you use.

Questions? Email Maisie Kingren: mlswans2@illinois.edu
Materials Safety at MRL

Prior approval and staff permission are required before bringing new or hazardous materials into MRL.

Submit a **Change of Scope proposal** to your project if your materials change.

Discuss materials with MRL staff for *each* instrument. Have the SDS available for review.
Transport of Material

Use freight elevator for:

- Compressed gas cylinders
- Cryogenic dewars
- Chemicals
- Carts and heavy objects
- Equipment

Do not travel with hazardous materials.
Transport of Material

Secondary containment is required for liquids > 500 mL (use a bottle carrier).

Transport materials through public areas in a way that doesn’t require gloves.
Labeling Containers

Chemical containers must have labels!
No “mystery materials”! Please write clearly!

Secondary containers must have:
- Full chemical name
- Warning statement
- Solution or mix concentrations
- Preparation date
- Name, net ID and MRL user number

Avery labels (transparent sticky sheets) can be bought in the MRL-Loomis storeroom.

Waste containers must also be labeled “WASTE”.

http://www.drs.illinois.edu/SafetyLibrary/LabelingChemicalsInLaboratories

http://blog.weberpackaging.com/?p=1626
What Do I Do with Waste?

If you generate waste at MRL, bring it back to your own lab or dispose of it in specified containers.

Follow the DRS waste disposal guide:

Getting things done at the Frederick Seitz Materials Research Laboratory Central Research Facilities Orientation for New Researchers
Everyone must:

• Submit a proposal online.
• Have their project approved.
• ALWAYS carry your I-Card.
• Be trained by MRL staff.
• Request room access online.
• Submit a change-of-scope proposal to add techniques or materials.
You will need additional safety training beyond MRL Orientation before you can work in MRL’s:

- Microfab Facility
- Laser and Spectroscopy Facility
- X-Ray Diffraction Facility
The Training Process

1. **Pre-training**
   - BEAP, perhaps DRS safety certificates
   - Some instruments require background reading/seminar before the first training session
   - This makes the in-person training go faster

2. **In-person Training**
   - Some instruments offer group training

3. **Room Access**
   - Different instruments have different requirements

4. **Further Training**

- **Supervised Sessions**
  - Some instruments require several sessions

- **Final Training “Test”**
  - Demonstrate safe and effective operation of the instrument

- **Advanced Training**
  - Advanced or special modes require additional training

- **Refresher Training**
  - If you haven’t used the instrument in a few months, contact MRL staff for a quick refresher training session
The Training Process

- Demonstrate safe and effective operation of the instrument.

Final Training “Test”
The Training Process

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Final Training “Test”
   - Demonstrate safe and effective operation of the instrument

Refresher Training
   - If you haven’t used the instrument in a few months, contact MRL staff for a quick refresher training session
How to Request Training and Schedule Time on Equipment

https://cmmserv.mrl.illinois.edu/
(try it this way first)

Here’s a video walkthrough of the scheduler:
https://www.youtube.com/watch?v=kElGtjcGi-E
Some instruments do not have “Request Training” available via the online schedule.

- The “Request Training” button brings up a pop-up box

Email the staff member(s) in charge of the instrument.

- Listed in training request pop-up box
- Directory (by instrument group) in entryway and by elevators
Prepare for Your Training Session

The well-equipped trainee...

- Brings a pen or pencil, notebook and/or instrument instructions to the training session.

- Has an alert and inquisitive mind.
  Take notes, ask good questions, and respond to the trainer.

- **IS ON TIME** to the session!

- Leaves texting and messaging for later.

*Your PI is supporting your work by paying for you to learn!*
If You Are Late for Training

If you are ≥ 15 minutes late

- You will be charged for ½ hour of training time.
- Your PI will be notified.
- You will move to the bottom of the training queue.

If you must be late or absent

- Email the staff as far in advance as possible:
  Other researchers may be able to use the time
Paper Logbook Recording

Instrument usage is recorded using

- The online schedule: [https://cmmserv.mrl.illinois.edu/](https://cmmserv.mrl.illinois.edu/)
- Paper logbooks
- Cleanroom log-in/out laptop

Accurately report your equipment usage

- Failure to report this accurately is considered theft of instrument time.
- Report the amount of any consumables used with the instrument (example: amount of gold sputtered).
At the End of Your Session

Sign out in the logbook. Legible writing please!

Save your data

- MRL instrument computers are not long-term data storage (data can get lost).
- How you transfer data depends on the instrument. USB vs. internet, shared folders
  Virus-scan your USB drive before bringing it to MRL

If you finish early, delete the remaining time and notify the next user.
Scheduling Etiquette for the Responsible MRL Researcher

• Most instruments are used by between a dozen and a few hundred researchers—be considerate!

• Be patient when trying to get time/training on heavily-used equipment.

• Until you’re good at the instrument, schedule time during workday hours when staff are around.

• If you can’t use your scheduled time, cancel as soon as possible. Check sign-up rules to see restrictions on late cancellations.

• Don’t reserve time you don’t expect to use.
Not Nice: Overscheduler

Signs up for extra-long sessions and cancels lots of time

At 8am, the schedule looked like this...

At 2pm, the schedule looked like this.

Other researcher says: “I could have used the instrument early... but I already canceled my plans for the evening.”
Not Nice: Overscheduler

Signs up for extra-long sessions and cancels lots of time

This person scheduled too many hours
• The cancellation was done so late that nobody else could plan to use the instrument during that time

But sometimes samples don’t work out
• It’s OK to cancel significant amounts of time occasionally (not too often)

Other researcher says: “I could have used the instrument early... but I already canceled my plans for the evening.”
How to Be a Responsible Researcher

**Do:**

Leave equipment and the instrument area in a usable and clean condition for the next researcher.

- Take your samples with you
- Put trash in appropriate waste containers
- Return all accessories to their proper storage location

Contact the staff if something is wrong with the equipment—do not try to repair things yourself!!!

- That’s what we’re here for.
- It’s a much more efficient use of your research time.
- The staff have experience fixing similar problems.
How to Be a Responsible Researcher

Do Not:

Take things!
• MRL equipment and consumables are for use in the MRL Central Research Facilities only.
• If you need to borrow something, talk to MRL staff first.
  - Even if your professor tells you to do it
  - Even if it’s just a little bit of consumable
  - Even if you plan to bring it right back

Install any software on MRL computers.

Use the internet on MRL computers for anything except:
• Data transfer
• Scheduling instrument time
• Research activities like looking up papers
As part of the MRL research community, I will...

Be Safe

• Operate the equipment as instructed by MRL staff.
• Follow safe work practices and report any accidents.
• Properly dispose of my materials and clean up after myself.
• Notify MRL staff if I notice problems with the equipment or observe unsafe or improper behavior.

Be Courteous

• Respect other researchers’ rights to use facility resources.
• Respect their samples and processes.
• Read all communications from MRL facilities (safety posters, instrument status or procedure updates, etc.).
• Ask staff for clarification if you don’t understand the communications.
The MRL Suspension Policy ensures that research is done safely and courteously.

• Suspension: You may lose access to an instrument or to all MRL facilities.

• Be a responsible mentor! Suspension of an undergrad means the postdoc/grad supervisor will also be suspended.
When Your Work is Published

All publications that incorporate results obtained through the MRL Central Research Facilities must include the following acknowledgement:

“...was carried out in part in the Frederick Seitz Materials Research Laboratory Central Research Facilities, University of Illinois.”

Please also send a copy of your publication to:

mrl-facilities@illinois.edu
Leaving Campus and MRL

Congratulations on completing your degree or your work here at MRL!

Turn in your keys to the MRL office and have your MRL User ID deactivated.

Note: You will need to have an active appointment on campus to do any work in the MRL after graduation.
Resources
For working at the
Frederick Seitz
Materials Research Laboratory
Central Research Facilities

Orientation for New Researchers
MRL on the Web

mrl.Illinois.edu
Staff directory, instruments, proposal portal, upcoming seminars and workshops

mrl.Illinois.edu/resources
Links to many useful documents for MRL users, including this presentation!
Connect with MRL on Social Media

Follow MRL on:

**Facebook**
https://www.facebook.com/mrlfacilities/
https://www.facebook.com/MaterialsResearchLab/

**Twitter**
https://MaterialsResearchLab@MRLatIllinois
MRL Workshops

Advanced Materials Characterization (AMC)
2-day workshop held early June each year introducing techniques and instruments available at MRL.

MRL Fall Conference
2-day workshop held November 8-9, highlighting more biological applications and poster/presentation competition.

mrl.Illinois.edu/fall2017

Specialized Instrument Workshops
Throughout the year with information and registration links posted on the MRL web.
Applied Vacuum Society Student Chapter

Free student membership for 1 year
No experience required

Outreach
- Vacuum demonstrations
- Engineering Open House
- Leadership opportunities
- Exploding PEEPS

Career development
- “How to give a presentation” faculty talk
- Learn about grad school
- Learn what research groups are doing

AVS and MRS trip to Argonne National Lab
Safety Contact

MRL Safety specialist
Maisie Kingren
295 B Engineering Sciences Building
mlswans2@illinois.edu

• Chemical waste questions and issues
• Lab safety questions

safety@mrl.illinois.edu

safety@mrl.illinois.edu
Engineering IT

264 MRL Computer Lab

• Open ~ 9am to 5pm
• Computers
  7 Windows, 1 Linux, and 1 Mac
  Not an EWS lab
  Log in with your NetID
• Printers
  Available to people in MRL or Physics research groups
  208 MRL contains 1 printer and is always unlocked
• Poster Printing
  go.illinois.edu/mrlposter
  Research posters only

For help using the computer lab email Engineering IT:
engrit-help@illinois.edu
Contacting the MRL Staff

In emails, please include

- Your MRL user ID
- Your name and research group

If requesting training, please provide:

- Details about your samples
- Your schedule availability
- Remember, most training can be requested online:

https://cmmserv.mrl.illinois.edu/
Thank you for coming!

Frederick Seitz
Materials Research Laboratory
Central Research Facilities

Orientation Team